

Math 155A - Fall 2021 - Quiz #1 - Hand in by 9:30am, October 1.

Start Time:

Your name:

Stop Time:

Integrity signature:

Time limit 15 minutes. Please add explanation below if over 17 minutes total.

1. Use the variables

f - "The coffee pot falls"

b - "The coffee pot breaks"

g - "The coffee pot is made of glass"

t - "The coffee pot is made of titanium"

and propositional connectives \neg , \vee , \wedge , \rightarrow , \leftrightarrow to express the sentences (a)-(g) as propositional formulas. When necessary, use parentheses to clarify the meaning of the propositional formulas. (You do not need include all the parentheses required in the formal definition of formulas.)

- (a) The coffee breaks only if it is made of glass.
- (b) The coffee breaks if it is made of glass and it falls.
- (c) The coffee pot is made of titanium or glass but not both.
- (d) The coffee pot falls if and only if it is made of glass.
- (e) The coffee pot falls but does not break.
- (f) The coffee does not break unless it is made of glass.
- (g) The coffee pot falls, but it does not break unless it is made of glass.

2. Using the same variables and **only** the connectives \wedge and \leftrightarrow , express the English sentence "The coffee pot is made of titanium or glass but not both" as a propositional formula. (It is possible you already gave this answer in part (c) above; if so, just reuse that answer.)